



# **Test & Evaluation for Scalable Effects Capabilities: Aberdeen Test Center as the SEC Test Center of Choice**

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Presented to  
Mines, Demolition & Non-Lethal  
Conference and Exhibition  
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# Agenda

- **Background of ATC and Scalable Effects Capabilities Team**
- **Initiatives**
- **International SEC Demonstration**



# ATC...A NATIONAL ASSET

## ...with International Impact





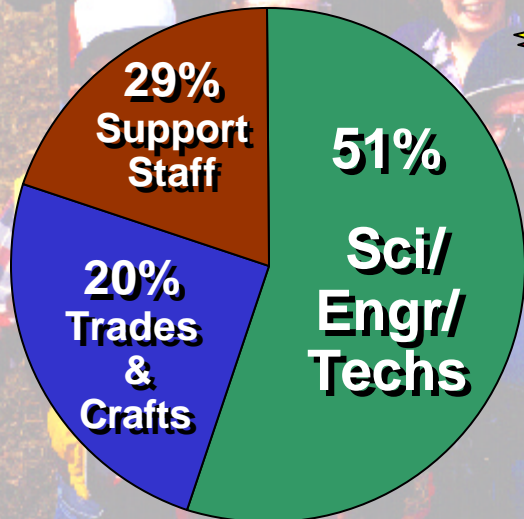
# ATC DEMOGRAPHICS



## PERSONNEL

Civilian 764  
Military 2 (6)  
Contractor 615  
TOTAL 1,381 (6)

APG  
Range  
Commander



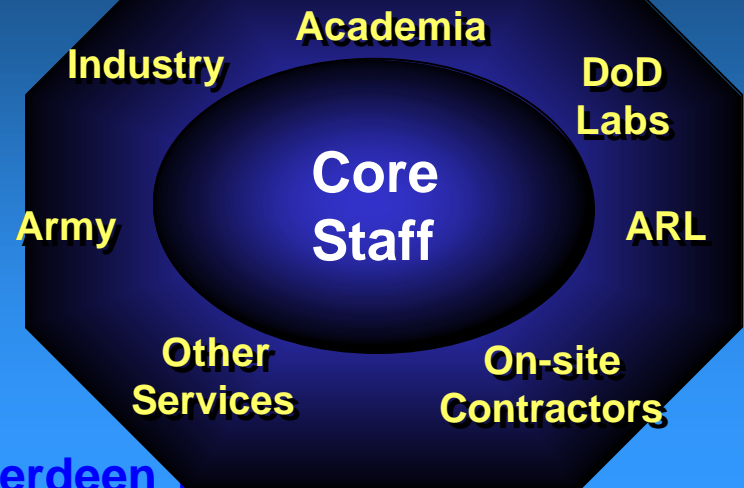
Sci/Engr/Techs  
Explosive Oper.  
Artillery Spec.  
Welders/Mach.  
Mechanics  
Scuba Divers  
Test Drivers

## INFRASTRUCTURE

Complex Worth About  
**\$2 Billion**

56,707 Acres  
40 Miles of Test Track  
60 Miles of Shoreline  
160 Firing Positions  
C5 Airfield  
Railroad

## PARTNERS



Aberdeen



# INSTRUMENTATION



## Portable & Fixed Instrumentation

- Cineradiography
- High-Speed Film
- Ultra High-Speed Digital Imaging
- High-Speed Video
- Doppler and Tracking Radars
- Video Scoring Systems
- Portable Gas Analyzers
- Thermocouples
- Accelerometers

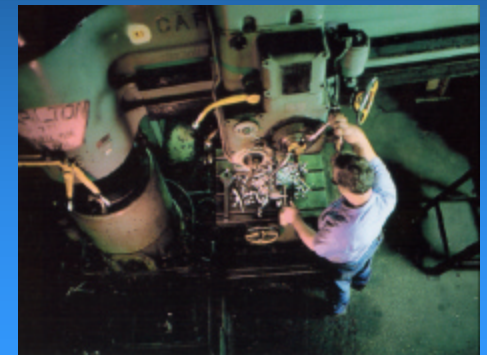
## Typical Data Collected:

- Internal/External Ballistics
- Terminal Effects
- **Impact Phenomenon (Specimen & Stimulants)**
- **Ballistic Shock**
- **Blunt Impact**
- **BioMechanics Human Survivability**
- Back Face deformation
- **Directed Energy Effects (Intensities, Frequencies, Target Coupling and Target Effects)**
- Electromagnetic Interference Scrambling
- Blast Overpressure
- Acceleration
- **Thermal Flash Effects**
- Strain
- Launch and Impact Velocities
- Distribution in Space
- **Toxic Gas Measurements**
- Signature Analysis



# FACILITIES

- Firing Ranges
- Chemistry, Metrology & Metallurgy Laboratories
- Mine/Countermine Test Facility
- Automotive Test Courses
- Environmental Simulation Chambers
- Fragmentation Arena
- Vulnerability Ranges
- Electromagnetic Interference Facility
- Underwater Explosions Test Ponds
- Emissions Chambers
- Fire Safety Test Enclosure
- Ammunition Loading Plants
- Experimental Fabrication Shops
- High Performance Computer Laboratory

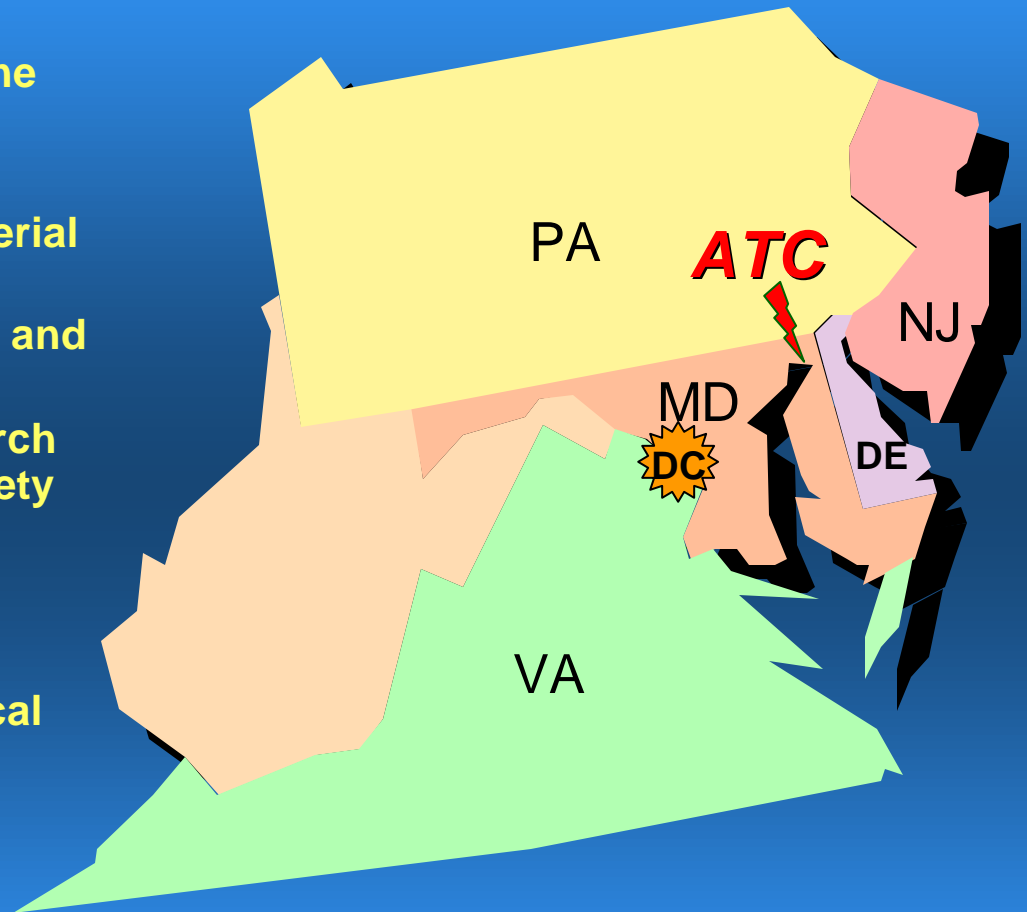




# Partnerships



- Program Manager, Mines, Countermine and Demolitions
- Program Manager, Small Arms
- U.S. Army Medical Research and Material Command
- U.S. Army Center of Health Promotion and Preventative Medicine
- U.S. Army Institute of Surgical Research
- University of Virginia Automobile Safety Laboratory
- Armed Forces Institute of Pathology
- U.S. Army Research Laboratory
- U.S. Army Soldier, Biological, Chemical Command, Soldier Systems Center
- U.S. Army Evaluation Center
- U.S. Army Materiel Systems Analysis Activity
- Walter Reed Army Medical Center
- Joint Non-Lethal Weapons Directorate





# SEC TEST EXPERIENCE



- Non-Lethal Munitions
  - Shotguns
  - Grenades
  - Mortars
  - Kinetic (all calibers)
  - Hand-Emplaced Munitions
  - Mine Dispensed



- Human Effects
  - Blunt Trauma Studies
  - Personal Protective Equipment Evaluations / Land Warrior
  - Crew Survivability
- High-Powered Microwave Systems



# FROM BLUNT IMPACT MUNITIONS . . . TO . . . DIRECTED ENERGY SYSTEMS



## M5, MCCM

- Non-lethal “Claymore Mine” that dispenses 600 .32 caliber PVC balls
- Effective area coverage from 5 to 15 meters across 120 degree front
- Conducted environmental testing & arena fragmentation in FY00 & 01

## Ground Vehicle Stopper

- High-power, electromagnetic, radio frequency system tested @ ATC in Spring 2001
- Directed energy disrupts the normal operation of engine’s fuel/air mixing system.
- Prior to this test series, range clearance encompassed 30 square miles





# SCALABLE EFFECTS CAPABILITIES INITIATIVES



- Develop Test Operations Procedures (TOPS) and International Test Operations Procedures (ITOPS)
  - Standardize Test Methodologies for Defense & Commercial Applications
  - Allow For Comparative Evaluation & Assessment of Current Capabilities
- Investigation of Methods and Technologies to Capture Data on Multiple Projectile Munitions
- Establishing a Human Effects Test Center in collaboration with national & international agencies and academia to address issues such as blunt trauma and other injury mechanisms



# Scalable Effects Capabilities Demonstration



- What: Demonstration of current and future SEC technologies from several countries
- When: Week of 23 Sept, 2002 as Part of NATO Land Group 3 Working Group Mtg. on MOUT & Non-Lethal
- Where: Aberdeen Test Center, SECToC  
Aberdeen Proving Ground, MD, USA
- Who: Selected US manufacturers and Govt. Labs
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**Experienced  
Personnel**

**Instrumentation**

**Facilities**

**Partnerships**

**Test  
Experience**

*Scalable Effects Capability*



*Test Center of Choice*